

# JACG JACG

NEWSLETTER  
Vol. 4 No. 3

NOV. 1984

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## THE JERSEY ATARI COMPUTER GROUP

### From the Editor's Desk...

Congratulations to Art Leyenberger being elected our new President. We are fortunate to have his talents and commitment available to us. We wish him well and look forward to the journeys and adventures he will share with us.

The JACG is, of course, the result of many people. The President gives us direction and makes key decisions which directly affect the complexion of the group. But it is the body corporal which makes us tick. I would like to take a moment to thank some of those key people who have helped all of us, and especially me, so much and have had to temporarily step down because of personal commitments.

Our recent Secretary, Anne Tom and her husband, Harold Wolverton, put in countless hours making sure that you got your copy of the newsletter. Rich Rospond, as Program Chairman, spent much time pleading, cajoling, and just plain bugging people to bring their knowledge to us as presenters. Herb Lehner talked thousands of minutes in our behalf, tempting businesses to spend money advertising in the newsletter. As our Advertising Manager he brought in considerable money which, in effect, lowered the cost of the newsletter for you and me.

To all of you, many thanks for a job very well done. We hope your involvement with the JACG was a rewarding one and that when time allows you will come back and help us again.

Help is what we need. Our frequent slogan, GIVE A BIT, has special meaning at this time. The cost of mailing the newsletter is going up. The reason is painfully simple. Too many people are not picking up the n/1 in person, even though we see them at the meetings! Cost for mailing runs from 37 to 54 cents per. It doesn't take long for this expense to mount into big dollars and erode our treasury.

The answer is also simple. Pick up your newsletter or make arrangements to have someone pick it up for you. We need two volunteers to help us distribute the newsletter at the two doors to the auditorium. How about that half hour a month from you? If several of you come forward it means only a couple of hours a year and you will be helping us eliminate what is becoming a major problem.

This is it. Decision time. Do you continue to be a Taker or will you be a Giver for a while? If that pangs your conscience a little all is well. See Larry Moriano or anyone who seems to know something. We look forward to working with you.

By the way, thanks for your help.

Frank Pazel  
Editor-in-Chief, JACG Newsletter

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### MARK YOUR CALENDARS!!

#### JACG Meeting Schedule

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December 8, 1984  
January 12, 1985  
February 9, 1985  
March 9, 1985



## From the Conn.....

As the new President of JACG I find myself taking office at a curious time. On one hand, JACG is healthy. Membership renewals are strong and we currently have close to 500 paid members. Our finances are also in good shape. We have enough money to cover the cost of newsletter production well into next year and have money to cover the other assorted costs of JACG operation. The disk and tape library operations are going very strong, providing continuous revenue each month to not only cover the cost of buying blank disks, but even to show a small profit.

On the other hand, Atari is reported to not be in such strong shape. Very little news has come out of Sunnyvale in the last several months and speculation, hearsay and rumors form the basis of just about all discussions of Atari. Reportedly, JTari is having difficulty collecting their unpaid debts while at the same time are refusing to pay many of their own debts. Litigation is the big game in town with lawsuits involving JTari, Commodore, Amiga and Synapse, just to name a few. The only official information from JTari is that they plan to continue to be in the home computer and video game markets as long as they appear to be profitable and that they will soon branch out into the world of business computers with an inexpensive, high-powered computer similar (it is rumored) to the Apple Macintosh. Personally, I think JTari has a tough road ahead if they really plan to enter the business market. Not only are they a newcomer to this area, but the name "Atari" is hardly a common word in the business world. Also, I find it ironic that JACG has more members than JTari has employees.

What does all this have to do with JACG, you might ask? Our group has existed and even prospered without the help of Atari for over three years. We will continue to do so and we will continue to offer our members a source of information, enjoyment and education concerning the world of Atari computing. With the help of the existing volunteers who already put in countless hours on behalf of our group, and hopefully with the help of other members (what have you recently done to help out?), we will continue to be the greatest Atari user group in the country.

I would personally like to thank Dick Kushner for a number of things. First, for founding JACG and having the perseverance to maintain the leadership necessary to continue the group's high quality. Second, for allowing me to become involved with the newsletter over two years ago which was a learning and rewarding experience. Finally, for the friendship and stimulating discussions he has afforded me. I think we all share in our appreciation of what Dick has done and we will continue to grow from the roots he has planted.

As Dick retires and takes up a less active but still involved role in JACG, I say, Dick Kushner, live long and prosper. And thanks. To the membership of JACG I say, stay tuned, we will be even bigger and better.

On a more pragmatic note....., we are in

need of some volunteers to open up and close the auditorium, before and after our monthly meetings. This person or persons has to be a Bell Labs employee in order to get the key for the equipment room and ensure (the day before) that we have the projection TV and PA system that we need for the Saturday meeting. We also need someone to put the equipment away and lock up. Vince Murphy has been taking care of these responsibilities for as long as I can remember but he cannot continue to do so.

Unless we can handle this task in a responsible way, our excellent meeting facilities may be in jeopardy. Please, won't someone come forward and volunteer to help. Give a Bit!

Along the same lines, we are in need of another volunteer to fulfill an important post. JACG needs a program chairperson to coordinate the monthly meetings and act as MC during the meeting. The majority of time in this job is spent on the telephone. Scheduling speakers, demos and other features for the meeting. Qualifications for this post consist of a person's desire to contribute to the organization. The Program Chairperson does not necessarily have to give talks and demos.

If you or anybody you know is interested in becoming famous and receiving the appreciation and support of all JACG members, please contact me as soon as possible. It is about time that more than just a handful of members do all of the work.

Arthur Leyenberger -- JACG President



Frank Pazel and Art Leyenberger present outgoing President Dick Kushner (center) with a plaque in recognition of his service to JACG. The plaque reads "Presented to Richard Kushner - Founding Member - First Newsletter Editor - First President - In Grateful Recognition For Countless Hours Dedicated to J.A.C.G. - October 1984". Dick received a standing ovation from the appreciative membership.



## OCTOBER MEETING HIGHLIGHTS

Reported by  
Joseph S. Kennedy

Outgoing President Dick Kushner gave his Farewell Address to the group. Dick recounted the history of the JACG and thanked the many people who he has worked with in the group. The audience gave Dick a rousing, heartfelt standing ovation at the conclusion of his talk. (Many thanks Dick for your efforts over the years to give us such a fine group.)

The following were then elected to the respective offices for the next year:

President - Art Leyenberger  
Vice President - Scott Brause  
Secretary - Larry Moriano  
Treasurer - Ron Kordos

Art made some brief comments on his ideas for the next year which include the installation of a JACG Hotline.

Frank Pazel presented Dick Kushner with a plaque honoring his service to the JACG.

Mark Chasin and Greg Tremor of MMG Software gave a review of their Basic Compiler. The demonstrations showed a very marked increase in the running speed of a compiled program over a basic program.

Frank Pazel demoed Spelldiver, an entertaining program with alleged educational value. Due to the nature of the program Frank rated the educational value at a C-.

Art demoed Relax from Synapse. This program and hardware enable you to learn how to relax and relieve stress more easily.....(ZZZZZZZ)...ly. It also includes a game that tests your control over your stress level.

See you in November.

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*** BULLETIN BOARD ***
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*** 24 HOURS/DAY ***
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*** 201-549-7591 ***
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GIVE A BIT!!!

Contribute to the Newsletter this month.



## Atariwriter Underground Part II

by Frank Pazel - JACG

### Phone Lines and Block Moves

The Atariwriter ROM has, in addition to the ability to do a form of mail merge discussed in last month's newsletter, the mechanism to transfer files via a modem.

In order to use this hidden modem handler you must boot up a copy of the original DOS 2.0 Master Diskette which came with your disk drive. Most people are unaware that stuck away on its mysterious recesses is the RS232 information for handling modem operations. If you are using OSS software it is a file called "RS232.COM". Both communicators must be running through an 850 Interface Module. Using Option E rename it "AUTORUN.SYS" and you are in business. Once both ends of the telephone connection have contacted each other files are SAVED or LOADED from "R:filename". Try it, and save some transfer time.

The final little trick that Atariwriter will do for you is a variation on its Duplicating Text feature. Rather than using the copy function to copy within a file you can use it just as well to copy from file to file. Use the Duplicating Text sequence described on page 37 of the instruction manual. This amounts to marking the beginning and ending of the text block you want to move with a CTRL-X. At this point, however, press ESC and return to the menu. Select to Create a new file or Load a file, depending on how you want to use your extracted block of text. If you load a file enter the Editor, position the cursor where you want to enter the saved block of text and press OPTION D. The saved file has been residing in the copy file buffer and can be used again and again. This is especially handy if you are preparing a report which uses a special format that must be repeated. To repeat copy just place the cursor where you want to replicate the saved block of text and press OPTION D. No need to remark and save it each time. If you save a new block of text with CTRL-X, that new text will, of course, replace the previously saved block.

The Atariwriter is truly a fine piece of software. Each day I wonder how I could get through my workweek without it. If you discover some new or undocumented features please send them along so we can publish them for the good of the order.

Thanks for some of the source material for this article goes to Clyde Pritchard of the Portland Atari Club and an article in the ACE of Syracuse newsletter.

◆ ◆ ◆ ◆ ◆  
THE DISK LIBRARY

NEEDS YOUR CONTRIBUTION

Share Your Original Program With Us



Getting Down to **BASICs**  
by Richard Kushner - JACG

Anyone who has seen the Atari game "Rescue at Fractalus" has probably already been exposed to the world of "fractals". It is fractal mathematics that is used to generate the mountain ranges of this game. This is a big advance over the idea of plotting the mountains coordinate by coordinate and then keeping track of the movement of each point as the view shifts. From my reading, I have seen how fractals are being applied to mimicking many natural phenomena. They have the interesting property of retaining their general form as you look at more and more detailed pieces of them, that is, as you take a more and more magnified look at them.

My interest in fractals was sparked by an article and BASIC program in the September '84 issue of BYTE magazine. An Apple BASIC program was presented that permits one to see how fractal patterns are generated. I refer you to that article for an explanation of what the program does. Most of the work with fractals is done on very powerful (ie., Cray) computers and displayed on screens with at least 1000X1000 resolution (as opposed to the Atari's 320X196 resolution in GRAPHICS 8). But it is still fun to play around with these things and try out a variety of inputs to see what interesting patterns can be generated.

My adaptation of the program is given below. I've used GRAPHICS 8 to give the most possible space to plot points. The user inputs four numbers: LAMBDA (X,Y) which describes the fractal to be plotted, SCALE which determines how large the figure will appear on the screen and NUMBER which tells the computer how many points to plot. The text window at the bottom of the screen shows a running count of the number of points plotted. It is generally best to start with a SCALE value around 4, trying other values to plot interesting figures on a larger scale. Smaller SCALE values mean higher magnification. If the magnification is too large, many points will fall off the screen. The program takes care of values too large or too small to plot in lines 6002-6008, where these points are plotted on the screen edges. If your plots are flattened on their outer extremities, use a larger SCALE value. I also had to use the ABS function in lines 1020 and 1030 to prevent "negative squareroot" errors from crashing the program.

Also shown below are three representative plots and the LAMBDA (X,Y) values that were used to generate them. The first actually has a name, the dragon, and the second is a variation on that theme. The bottom one is a good one to show how the detail seen in the larger pieces propagates down to the smallest pieces you can see. I plotted 10,000 points to get these figures and this took quite a while

(more than one hour each). One hundred points doesn't show up enough detail, but a couple of thousand points is really sufficient. Because the figures are pretty regular, with a degree of randomness, many points end up getting plotted and replotted many times. I encourage you to play around with this program and explore the world of fractals on the Atari computer.

Next month, we'll go back to explore the SINESCAPE program of last month. We'll show any interesting variations on the program that I happen to have sent to me and see if we can create some of our own.

```
10 REM FRACTAL PROGRAM BY GREG TURK
20 REM FROM BYTE/SEPT '84
30 REM MODIFIED FOR THE ATARI
40 REM BY RICHARD KUSHNER -JACG
50 CX=160:CY=80
60 X=0.50001:Y=0
100 GOSUB 5000
110 GRAPHICS 8:POKE 752,1:COLOR 1
120 FOR I=1 TO 10:GOSUB 4000:NEXT I
140 GOSUB 6000
150 GOSUB 4000
155 COUNT=COUNT+1
156 IF COUNT=NUMBER THEN PRINT "ALL DONE!!!!":END
160 GOTO 140
999 END
1000 REM SQUARE ROOT OF X,Y
1005 T=Y
1010 S=SQR(X*X+Y*Y)
1020 Y=SQR(ABS((-X+S)/2))
1030 X=SQR(ABS((X+S)/2))
1040 IF T<0 THEN X=-X
1050 RETURN
2000 REM FOUR OVER L
2010 S=LX*LX+LY*LY
2020 LX=4*LX/S
2030 LY=-4*LY/S
2040 RETURN
3000 REM X,Y TIMES L
3010 TX=X:TY=Y
3020 X=TX*LX-TY*LY
3030 Y=TX*LY+TY*LX
3040 RETURN
4000 REM FUNCTION OF X,Y
4010 GOSUB 3000
4020 X=1-X
4030 GOSUB 1000
4040 IF RND(0)<0.5 THEN X=-X:Y=-Y
4050 X=1-X
4060 X=X/2:Y=Y/2
4070 RETURN
5000 REM GET VALUES
5010 GRAPHICS 0
5020 ? "WHAT IS LAMBDA? (X,Y)";:INPUT LX,LY
5030 GOSUB 2000
5040 ? "WHAT IS SCALE ";:INPUT SC
5050 SC=2*CX/SC
5060 PRINT "NUMBER OF POINTS TO PLOT";:INPUT NUMBER
5070 RETURN
6000 REM PLOT X,Y
6001 XX=SC*(X-0.5)+CX:YY=CY-SC*Y
6002 IF XX<0 THEN XX=0
6004 IF YY<0 THEN YY=0
6006 IF XX>319 THEN XX=319
6008 IF YY>159 THEN YY=159
6010 PLOT XX,YY
6020 RETURN
```



## MATHFACTS

\*\*\* For ATARI Computers \*\*\*

Teachers, parents,... have you ever wished that someone would come up with a math drill and testing program that you could easily fine tune to your students or child's level? A program that would enable you to sit a child down unattended at the computer, have them take one or more tests, and have the results of each test automatically printed out for analysis and review at your convenience? Well, MATHFACTS<sup>(C)</sup> is here!

\* Includes all four basic math functions: addition, subtraction, multiplication, and division.

\* Teacher/parent selectable test parameters: number of problems per test (1 to 99); range of numbers used in problems (-99 to +99); time limit allowed per problem (1 second to 99 minutes).

\* Automatic printing of detailed test results to printer or TV. If you don't have a printer, you can display the test results on your TV screen. If and when you get a printer, MATHFACTS has a feature that lets you easily switch the printing of the test results from TV to printer.

\* Large, easy to read screens (graphics 1 and 2).

\* Fully trapped and "bomb" proof.

\* Comprehensive user documentation.

MATHFACTS is available on disk for ATARI computers (requires Atari BASIC and a minimum of 32K ram) and currently supports Epson and Prowriter printers.

For your copy on diskette, fill out the form below and send it with a check or money order made payable to R.G. Barclay, for \$20.95 (\$19.95 plus a \$1.00 shipping charge) to:

R.G. Barclay  
RIKEMI SOFTWARE PRODUCTS Co.  
RD #1 Country Hill Rd  
Lebanon, NJ 08833

Please allow two to four weeks for delivery.

Name \_\_\_\_\_  
Street & no. \_\_\_\_\_  
City and State \_\_\_\_\_ Zip \_\_\_\_\_

Computer model: \_\_\_\_\_ Printer model: \_\_\_\_\_

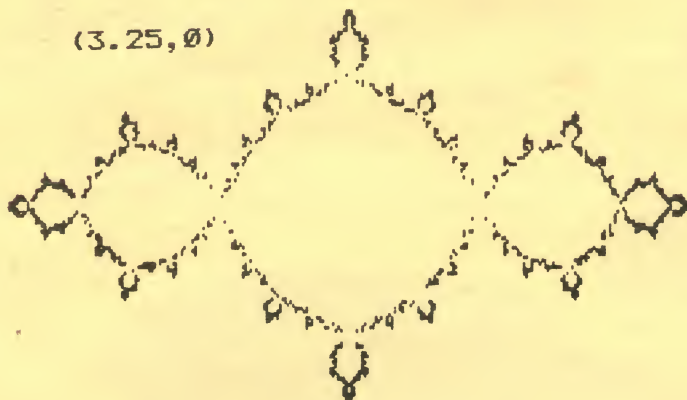
(0, 1.00)



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(3.25, 0)



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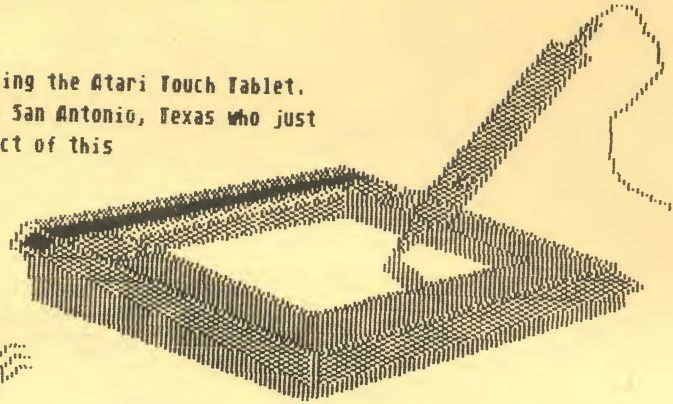
NEXT MONTH!!  
YOUR ARTICLE

Could Be In This Space  
And Beyond.....

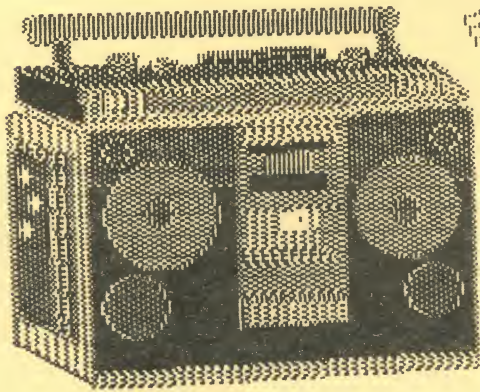


## The Graphics Tablet

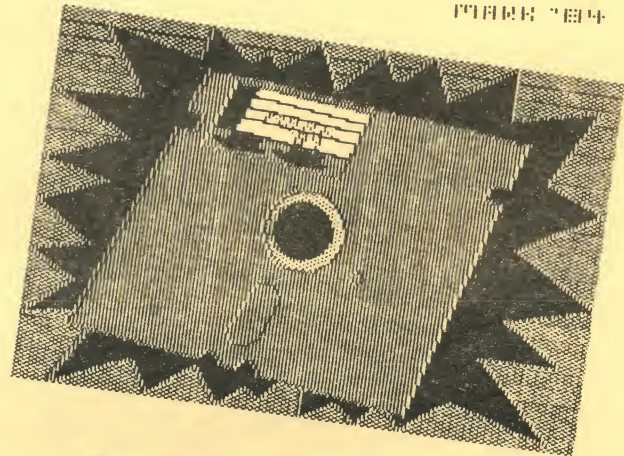
These terrific examples of computer art were produced using the Atari Touch Tablet. The very talented artist is 16 year old Mark Pedersen of San Antonio, Texas who just happens to be the nephew of Dick Kushner. The full impact of this work is only viewable on a quality color monitor but we thought you would be inspired to send us some of your work from any graphics source by seeing Mark's work. As space permits we will print more of the dozens of pictures he sent us. Thanks, Mark!



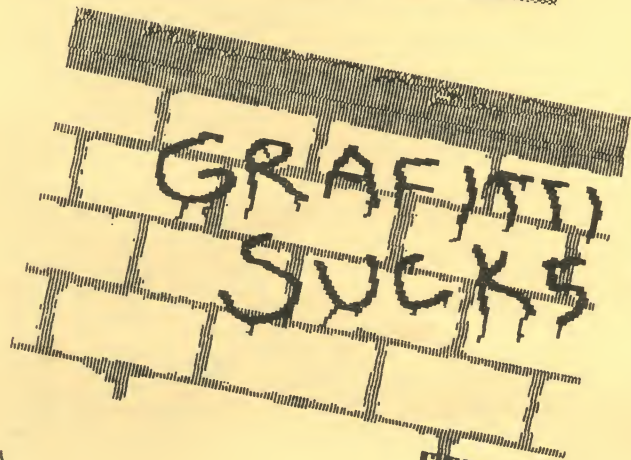
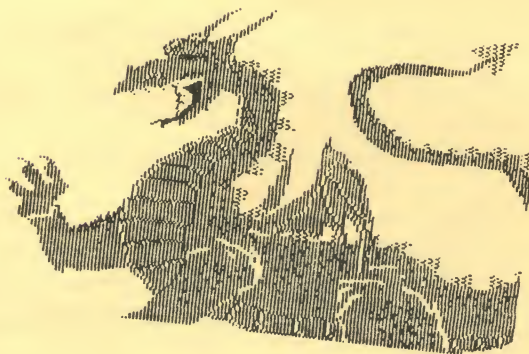
MARK '84



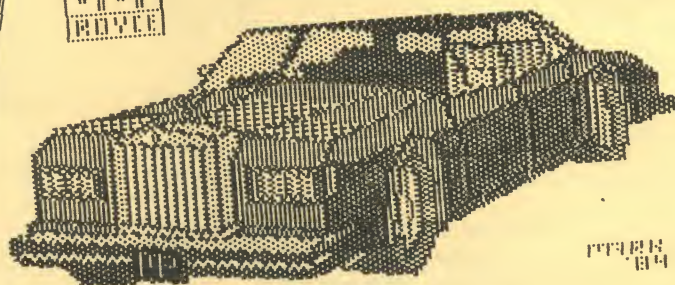
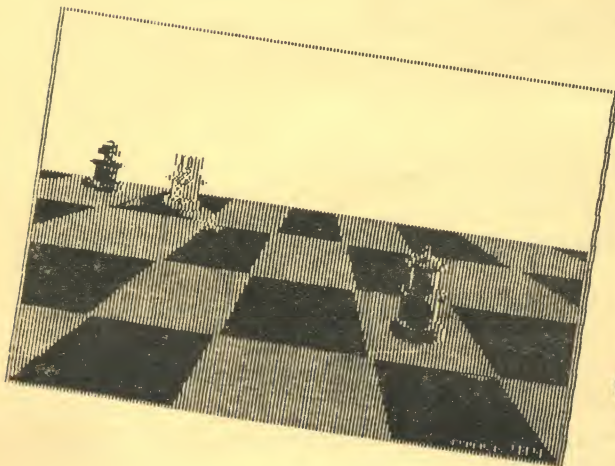
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'84



MARK '84



MARK  
'84



# G E M I N I / S

## ATARI COMPUTER & ACCESSORY BUYER'S GUIDE

\*\*\*\*\*  
 N E W       I T E M S       I N       S T O C K  
 \*\*\*\*\*

Until now, there was no reason to buy another DOS for your computer

**Introducing SpartaDOS<sup>tm</sup>.....\$ 34.95**

A resident DOS that supports all drives, all densities, 5-1/4 and 8 inch, single or double sided, time/date stamping of all files, unlimited multiple directories, user created batch files, automatic (intelligent) format selection, works with ALL Atari compatible drives including ATR8000.

\*\*\*\*\*

Finally, true DOUBLE DENSITY for the Atari 1050 and its affordable!

**Introducing US Doubler<sup>tm</sup>.....\$ 64.95**

turns your Atari 1050 into the drive Atari should have made. Fully compatible with all existing software. When used with included SpartaDOS, UltraSpeed I/O reads and writes an amazing 3 times faster than your present 1050 - plus in single density, density and one-half (DOS 3), and true double density! Installation required and at extra cost.

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 \*                    MUSE'S                    \*  
 \* "BEYOND CASTLE WOLFENSTEIN"           \*  
 \*                    \$27.95                    \*  
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 \*                    O.S.S.                    \*  
 \* "W R I T E R S   T O O L"               \*  
 \*                    \$99.95                    \*  
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 \*                    ATARI CX75                    \*  
 \*       L I G H T   P E N                    \*  
 \*                    \$49.95                    \*  
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 \*                    ATARI ARCADE CHAMP                    \*  
 \*       P A C M A N , Q I X , P A I R J O Y S T I C K S           \*  
 \*                    \$29.95                    \*  
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 \*       "C U T   T H R O A T S"               \*  
 \*                    \$27.95                    \*  
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 \*                    INFOCOM'S                    \*  
 \*       H I N T   B O O K S                    \*  
 \*                    \$5.95 ea                    \*  
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 \*                    MICROPROSE                    \*  
 \*       "F15 STRIKE EAGLE"               \*  
 \*                    \$27.95                    \*  
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 \*                    SSI                    \*  
 \*       "BREAKTHROUGH IN THE ARDENNES"           \*  
 \*                    \$47.95                    \*  
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What Language Does Your Atari Speak?:  
A Guide to Programming Languages  
Available for the Atari Computer  
By Arthur Leyenberger - JACG

Copyright (c) 1983 by Arthur Leyenberger

Welcome back to my continuing series of articles on programming languages. I hope you enjoyed last month's discussions of Machine Language, Assembler, Disk Operating Systems, and Basic. This month I'll talk about Atari Microsoft Basic and get into some of the more esoteric, but useful, languages.

#### TOP-DOS

Last month I talked about Disk Operating Systems but failed to mention two important and significant DOSs: TOP-DOS (used to be called DOS-Mod) and MYDOS.

A useful DOS utility and one that I would recommend to anyone who does a lot of file manipulation is TOP-DOS from Eclipse software. TOP-DOS is completely compatible with Atari DOS 2.0S and contains a number of enhancements. Although TOP-DOS has many, many more features than Atari DOS 2.0, the memory-resident portion of TOP-DOS is the same size as that of Atari DOS.

How would you like to be able to use full screen editing when using DOS, just like you do when using Atari Basic? You got it. How about being able to see more of what you are doing on the screen? No problem, TOP-DOS gives you more than half the screen since its compressed menu takes up less room. Another aid to let you know what is going on is the minimum of screen clearing that occurs.

If this was all that TOP-DOS allowed me to do I would say, "ok, but so what?". There's more. Commands that used to take several lines and require answering prompts can now all be put on one line. The wildcard operators now work (as they should) with COPY, DELETE and RENAME. And get this, TOP-DOS lets you create command files which may contain a sequence of commands that will be executed in one operation. Finally, TOP-DOS fixes many of the bugs in Atari DOS such as the RS-232 handler being destroyed on RESET and typical MEM.SAV problems.

#### MYDOS

MYDOS is an alternative Disk Operating System (DOS) for the Atari computers. Produced by SWP, Inc., the makers of the ATR8000, MYDOS is attended primarily for their machine but will also work with Percom and other higher density disk drives (double density and double sided). The strength of this DOS lies in its power and ease of use. The program is not necessarily user friendly -- you must know what you are doing or you could easily trash an entire disk -- but it is easy to

use. Like TOP-DOS, multi-line, multi-keystroke commands can all be entered on one line, with fewer keystrokes and much more clearly.

MYDOS supports upper and lower case file names too. That is another "useful" but not necessarily "friendly" feature. Although you can pre-define the density of the disk drive (and disk) that you are using, MYDOS is smart enough to be able to read a disk in a format different from what you specified. When copying an entire disk with the "J" command, MYDOS is nice enough to automatically format the disk for you unless you say otherwise.

#### Atari Microsoft Basic

Atari Microsoft Basic comes in two flavors -- a disk based version and a cartridge/disk version (Atari Microsoft Basic II). Both versions contain the same capabilities but Atari Microsoft Basic II is preferred because the cartridge is a more durable medium for the language than an uncopiable disk.

There are a number of features implemented quite differently in Atari Microsoft Basic (AMSB) than in Atari 8K Basic or Basic XL. AMSB is a superset of Microsoft Basic and contains Atari-specific features for sound and graphics. There is no syntax checking during line entry so errors will not become apparent until the program is run.

Unlike Atari 8K Basic, you can choose the precision of numeric variables. single, double or integer variables are allowed. Math functions are performed in the interpreter rather than in the floating point package in the OS ROM which increases the speed of calculations.

One of AMSB's great advantages over Atari Basic and Basic XL is its ability to accept user-defined functions. This essentially lets the user make up their own Basic commands. Although there are no commands for joystick or paddle reading, they can easily be implemented with Defined functions or PEEKs.

Perhaps the most significant difference between AMSB and other Atari Basics is the way in which strings are handled. In Atari Basic strings are one-dimensional, must be DIMensioned and can be as long as memory allows. AMSB does not require one-dimensional strings to be DIMensioned, only allows a maximum string length of 255 characters and permits true string arrays. Other useful string functions are also included, such as: true concatenation, left, mid and right substrings and substring search.

There are quite a few advanced "housekeeping" commands in AMSB like automatic line numbering, line renumbering and line deletion. There are direct commands that interact with DOS such as KILL (delete a file), NAME (rename a file) and LOCK/UNLOCK. Other useful advanced



features allow the ability to trace the execution of a program and pass the values of variables from one program to another. Additional or modified statements include WAIT (for halting a program for a specific amount of time), IF...THEN...ELSE (for better program testing) and the combining of PLOT and DRAWTO into one command - PLOT TO.

#### PASCAL

Pascal was invented by Kathleen Jensen and Niklaus Wirth as a tool for teaching ALGOL (Algorithmic Language) and to demonstrate the principals of a structured language. Pascal is an easy language to learn and is suitable for defining the data structures needed for problem solutions. The language was named for Blaise Pascal, the French mathematician who invented one of the first mechanical computing devices.

Pascal allows data types such as integer, real, and Boolean, but gives the programmer the freedom to define new data types. New functions and procedures may be defined and character data and strings may be manipulated. It is a compiled language, but it does not usually compile into machine code. Instead, it compiles into an intermediate pseudo-code called p-code. The p-code is then saved and at run-time, the file is interpreted into the machine code of the computer.

There are two implementations of Pascal for the Atari computer. One is available from the Atari Program Exchange (if you can still get it). It is based upon the standard PASCAL and is very similar to UCSD PASCAL. There are some minor differences involving the incorporation of graphics and sound capabilities. Unfortunately, its use is limited because it requires two disk drives and is not supported officially by Atari.

#### Draper PASCAL

The other version of PASCAL for the Atari computer is called Draper PASCAL. Many folks have knocked Draper PASCAL because it does not conform to the official PASCAL standard. It is not a full implementation of the language (either ISO or UCSD standards) and includes an abbreviated range of data types, a lack of number formatting and limitations on parameter passing. Now that I have told you what it is not, and what it can't do, let me tell you what it can do.

For one thing, Draper PASCAL is close enough to the real thing to make it suitable for learning the language or programming applications on the Atari. The language has machine-specific features such as disk management, I/O, string manipulation, BASIC-type graphics and sound and ability to read joysticks. There is also a CALL procedure which allows you to easily access your own machine-language subroutines.

I am not a fluent PASCAL programmer by any stretch of the imagination but I am familiar with the language and can write fairly simple programs. I was able to have a small PASCAL program written, debugged and running using Draper PASCAL in under 20 minutes from first opening the package.

The conclusion is simple. If you must have PASCAL for the Atari computer then Draper PASCAL is the only game in town. It's relative power and ease of use will make you feel like you are coding an application for one of the "big boys".

#### C Language

The language called C was designed at Bell Laboratories to exist within the UNIX Operating System. It is a structured language with some similarities to Pascal. However, the entire program structure is built through the use of functions called modules. There are no Print or Read statements and input/output is also done through use of modules. I/O structure is performed through the I/O structure of whatever operating system it is implemented on.

There are no line numbers in C. A program is written using an editor, then it is compiled and a linker is used to link all of the program modules together. A program starts with the name of the function, then a left bracket to start function definition. This consists of compound statements enclosed within two square brackets. Statements may be nested to any depth and are treated just like simple statements. There are libraries of standard functions and those functions previously defined by the user. Global and Local variables, arguments for the functions and expressions used to calculate and store data are allowed. C can call machine-language routines when needed in addition to any of the user-defined or standard functions.

C is available in two versions for the Atari: Tiny C and Deep Blue C. Tiny-C (now called C/65) is available from Optimized System Software and Deep Blue C is available From APX (APX-20166).

#### See You Next Time

That's it for this month. Next month I will wrap up the series by discussing LISP, FORTH, Logo and Action!. Until then, may all your subroutines compile.



**HAVE YOU RENEWED  
YOUR MEMBERSHIP?**

**CHECK YOUR MAILING LABEL  
FOR MEMBERSHIP EXPIRATION DATE**

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## FUTURE OF FORTH

by Donald Forbes - JACG  
201/377-1208

Here is the five-year outlook for FORTH, as I see it.

It is a fact of life that, to conduct our affairs, we are forced to forecast; and our success or failure will depend on the care with which we do so. As Napoleon said: "calculation must include the incalculable."

The military does not refer to its anticipations as forecasts; the staff officer prepares a statement of enemy capabilities, followed by an estimate of the situation (the enemy can attack on a 10-mile front with 3 divisions in four hours) which the commander then uses to prepare his five-paragraph field order: 1a intelligence of the enemy, 1b information of supporting troops, 2 mission of the unit, 3 mission of frontline troops, 4 supplies, and 5 location of the command post.

To evaluate the future of FORTH we must regard it as the 'complete software environment.' We must also look at two aspects -- the hardware aspect and the software aspect.

### HARDWARE

FORTH in hardware has been available for a few years. For \$150 you can buy a book-sized computer, the British-made Jupiter ACE, that is programmed entirely in FORTH. Since early last year Rockwell International has offered two FORTH-based single chip microcomputers, the 40-pin R65F11 and the 64-pin R65F12, with fig-FORTH in preprogrammed ROM.

The last issue of FORTH Dimensions reports from the Arizona FIG chapter: "May 24: Charles Moore attended! He discussed his FORTH computer chip's architecture in detail. At the time, he was in Arizona testing prototypes of the chip prior to production runs. An overflow crowd attended and the meeting was video-taped. The tapes may be available for distribution after approvals are obtained."

You may have wondered why Chuck Moore never patented FORTH.

At his tenth anniversary speech to the convention in San Francisco October 1979 he explained: "FORTH seemed like something that perhaps should be patented, so we spent a year writing proposals, investigating and getting lawyers' opinions. The conclusion was that maybe it could be patented, but it would take Supreme Court action to do it. NRAO (Kitt Peak observatory) wasn't interested. As inventor, I had fall-back rights but I didn't want to spend \$10,000 either, so FORTH was not patented. This probably was a good thing. I think that if any software package would qualify for patenting FORTH would."

"It has nothing really innovative in it, yet the package would not otherwise have been put together. If you apply this reasoning to hardware, hardware is

patentable. It is one of my disillusionments that the establishment refuses to provide any effective protection for software. Probably it is the lack of vocal objection from within the industry and the willingness to acquiesce, knowing that today's software will be obsolete in a year anyway."

All this has now changed. TIME Magazine reported (Oct. 22) that "in an extraordinary 363-to-0 vote the House of Representatives passed a bill that would let chipmakers copyright their designs as if they were novels or plays. The measure...expected to be signed soon by President Reagan, is meant to safeguard the years of research and the tens of millions of dollars that it takes to create a chip that can pack several hundred thousand electronic circuits onto a silicon sliver smaller than a fingernail."

Chuck Moore, who failed to copyright his own FORTH as software, can now do so as hardware -- with significant implications for the future of FORTH.

Chips that can be copyrighted are likely to arouse investor interest, and will probably impact standardization efforts. The linkage of FORTH systems via computer networks for artificial intelligence, programming, and even games has already been anticipated by Chuck Moore.

### SOFTWARE

On the software side, we must look at potential developments in each of the four layers of the FORTH environment: applications, program development, systems programming and the assembly language level.

### APPLICATIONS

User-friendliness has been a major contributor to the success of BASIC (Kemeny and Kurtz, Dartmouth 1965). A group of major FORTH vendors have decided to buck the tide by offering floating point packages, and have agreed on specifications -- well ahead of the promulgation of the next FORTH standard slated for 1987.

In its recent release of the FORTH-83 standard, the standards team concerned itself only with the core of the language. No attempt was made to introduce standardization in such areas as floating point, the interface to host operating systems, graphics, or file management.

Data base management, and the use of FORTH in conjunction with other resident operating systems is likely to be expanded.

Other advances we can look for are likely to be uniform methods of string handling, as well as friendlier handling of string and numeric input/output.

Major improvements in graphics can be anticipated, because the high speed of FORTH will contribute a significant advantage, as the use of FORTH in Atari arcade games has already demonstrated.

FORTH can be expected to show a major expansion in applications of artificial intelligence, also known as "expert



systems." LISP has a head start in this field. However, in a Knowledge-based system developed by General Electric to diagnose and troubleshoot large electric locomotives, a FORTH system operating on a PDP-11 minicomputer was found to be smaller and faster than a LISP system operating on a VAX computer. GE wants to give a 1-year novice with a computer the same troubleshooting expertise as a 20-year veteran.

Mathematics applications promise to expand enormously. Hand-held calculators now incorporate procedures to handle complex numbers as well as integration routines, and elaborate statistical procedures. Yet a short FORTH program will emulate all the capabilities of a hand-held Hewlett-Packard calculator.

Rockwell points out in their documentation of their FORTH chips that "in most time-critical applications, at least part of the program must be written in assembly language. FORTH...lets you drop into assembly language at almost any point in your program, without separate assembly and load steps or awkward machine level linkage. FORTH programs typically run up to ten times faster than other interpretive languages, and can even approach the speed of machine language programs for some applications."

These features are relevant in a typical application, such as game implementation. As Chris Crawford says in his book: "One of the most common types of non-spatial games uses coupled differential equations to model complex systems...The behavior of systems of differential equations is complex. I suggest that designers interested in these problems study the mathematics of overdamped, underdamped, and critically damped oscillatory systems."

"These algorithms must be programmed. The computer game designer does not have life so easy. The design must be implemented on the computer by programming. This is a tedious and difficult process, and it is not easily delegated, for the programming effort exerts a major influence over the design process. Implementing a design well is a major hurdle for any computer game designer."

Crawford continues: "Programming is straightforward and tedious work, primarily requiring attention to detail. Seldom has a game failed solely because the programmer lacked requisite programming skills. Games have sometimes failed to live up to their potential because the programmer did not expend enough effort or rushed the job or didn't bother to write in assembly language. But in few cases has talent or the lack of it been the crucial factor in programming a game; effort or the lack of it is most often responsible. If you place all your self-respect eggs in the programming basket, I suggest that you get out of game design and work in systems programming. Otherwise, write the code and debug it."

Atari has used FORTH to program arcade games for the reasons Chris has made clear.

The last JACG user group meeting included a demonstration of a software package to convert interpreted BASIC to machine language code so as to gain execution speed. It is tempting to speculate whether there may be a market for a BASIC-to-FORTH software translation package which could provide assembler execution speed with the interactivity and modifiability of FORTH.

#### DEVELOPMENT

What advances can we anticipate at the program development level?

Unified editors conforming to a common standard is one possibility. FORTH editors now come in all shapes and sizes, largely because FORTH has been implemented on just about every microcomputer in existence. There is a need for a common format for editors.

The foremost change is apt to be a resolution of the proliferation of dialects in FORTH. A backward look will help. Philosopher Georg Hegel said that "what experience and history teach is this--that people and governments never have learnt anything from history." Historian E. H. Carr, however, observes that writing history serves "to promote our understanding of the past in the light of the present, and of the present in the light of the past."

According to author C. Kevin McCabe "the evolution of FORTH from a radio-telescope control language to an acclaimed software tool can hardly be termed usual--or entirely peaceful. Perhaps because the language is attractive to software hackers, new versions of FORTH appear with a frequency quite unlike more established languages. Proponents of various dialects tend to splinter into groups, with heated debates over mono-addressing, threaded versus direct code, and other esoteric matters."

Charles Moore invented FORTH in 1969 and treated it as a proprietary product. His version is the one that FORTH Inc. promulgated, financed, expounded, and copyrighted in Leo Brodie's tutorial 'Starting FORTH.'

Users worldwide got together in the mid-1970s to promulgate a common standard, which resulted in the FORTH-77 standard, and again for the FORTH-79 standard published in 1980.

In 1980 William Ragsdale, with the help of European astronomers, introduced his version (fig-FORTH) and placed it in the public domain.

It is important to understand the philosophical differences between fig-FORTH and FORTH-79. In the words of McCabe: "Fig-FORTH includes nearly 300 core words, but FORTH-79 has only 121. This does not mean that FORTH-79 is less useful or powerful than fig-FORTH. It is mainly a difference in philosophy. Fig-FORTH includes numerous words for stack initialization, text parsing, and other system functions."



FORTH-79 does not include many system-level words, since there is little need for words to alter the text interpreter or change the manner of stack initialization. As a result, FORTH-79 is easier for a novice or end-user to comprehend, but less useful for system-level programming...

"Fig-FORTH does not restrict user access to any part of the dictionary. All fields may be inspected and (with necessary precautions) changed at will. FORTH-79 applications which access the dictionary are allowed to address only the parameter fields of variables, constants, and words compiled by user-created defining words, and dictionary space that has been left by ALLOT; all other parameter fields, and the name, code, and link fields of all words, must not be accessed.

"In general, many of the 'bare bones' of FORTH, such as stack pointer values and initializers, are hidden and inaccessible to the user of FORTH-79. The philosophy of FORTH-79 is to provide all necessary high level operations, such as DEPTH, but not some of the more fundamental operations used primarily to construct the equivalent fig-FORTH operations. This makes FORTH-79 less complex and more oriented to the novice programmer and end-user, while fig-FORTH is more useful to the experienced or system-level programmer."

MVP FORTH published and placed in the public domain by Roy Martens' Mountain View Press has followed the fig-FORTH tradition of making everything accessible to the programmer.

The same FORTH-79 philosophy, however, is perpetuated in the FORTH-83 standard which removes 11 old words and adds 20 new ones. For example, programs are absolutely prohibited from addressing into the data or return stacks or any definition fields other than parameter fields stored by the application.

The reason is simple: the standard merely tells vendors WHAT to implement but resolutely avoids telling them HOW to do it.

The problem with standards, however, as Chuck Moore points out, is that "the standards team is talking, not about the words everyone is using, but the words everyone should use...A lot of the portability of a real program that you're going to run on your IBM PC isn't going to be interesting unless it does something with graphics...The standard doesn't address that interface at all, because it can't."

McCabe sums it up by observing that "in a language praised for its transportability, the abundance of competing--and generally incompatible--dialects may continue to be detrimental...There is no question that FORTH-83 is several steps ahead of earlier versions, but the scope of the revisions indicates a language still very much in flux."

FORTH on the Atari shows a similar diversity. Team Atari FORTH follows the Ragsdale model (which added 31-character

identifiers and error checking) and included an editor, graphics, a decompiler, and a disassembler.

QS FORTH followed the Ragsdale model with graphics commands. EXTENDED fig-FORTH from Patrick Mullarky added floating point. Then valFORTH went further with an expanded editor and turtle graphics.

As a consequence, an Atari FORTH programmer must start with a basic fig-FORTH model (such as Team Atari FORTH) and then add the definitions (in fig-FORTH) that will give him access to Brodie's PolyFORTH, the FORTH-79 extensions (such as PIC and ROLL and the double numbers defined in Scanlon's "FORTH Programming") and finally the new words in FORTH-83.

It is also tempting to speculate that the dialect conflict will eventually be resolved by a fig-FORTH type chip that will incorporate the new definitions of the latest standards but still give the programmer access to all the underlying code, and thus allow him to retain complete control over the hardware.

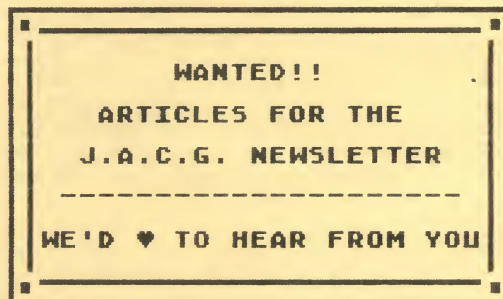
#### SYSTEMS AND ASSEMBLER LAYERS

If a version of FORTH along the lines of fig-FORTH achieves supremacy we can look for a systems level standard. Uniform procedures would be set up for the inner workings of FORTH (specifically, the return stack, the text or outer interpreter, the address or inner interpreter, and the virtual disk).

The systems aspect of FORTH has been neglected in the literature. The primary sources (other than technical articles) continue to be the following books: the Ragsdale documentation of the Fig model, C. H. Ting's 'Systems Guide to fig-Forth', MVP's FORTH Encyclopedia, and a partial discussion in 'And So Forth' by Timothy Huang published in 1982 and revised in 1983.

At the assembler level, the expanded availability of FORTH on a limited number of standardized chips will provide a powerful inducement to assembly language programmers to switch, and thereby gain the advantages of easier debugging, faster execution, the availability of DO...LOOP and IF... ELSE... THEN constructions for structured programming, and the ease of FORTH modifiability.

"Prediction is always difficult, especially when it involves the future." This is not the final word. You are invited to build upon this base to contribute your own trenchant and perspicuous forecast for Frank to publish in our newsletter (on disk, please; no PAPER!).





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and ecology; fosters under-  
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8 and up - write and compose  
music, songs; learn musical  
concepts  
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learning program based on de-  
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vocabulary skills

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tutor for beginners and exper-  
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and designs  
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3-6 years - coloring book;  
helps child develop critical  
color discrimination, match-  
ing and memory skills  
PAINT - Atari..... 24.95



## Beyond Armageddon Adventures in Adventuring

by Lord Demonfire

True to my word, I am answering mail this month. I have decided to usually give oblique hints to adventures, rather than telling exactly what commands to use, in order to keep from ruining the adventure for everyone. If, however, I get reader response to questions, I will print them verbatim. Shall we begin?

**Zork I:** "I can't get by the cyclops, get a light through the crack in the timber room, get into Hades (Do I want to?) or get through the wooden door in the living room. And what does one do with the hanging basket in the shaft room?" - Roy Lent, JACG, Costa Rica

I love long ones. First of all, two of your problems are really one. Getting by the cyclops solves the problem of the wooden door in the living room. Perhaps if you drop the name of a fellow adventurer to the cyclops, doors might open (figuratively and literally.) Maybe the name of a legendary cyclops-enemy would do.

How do you get a light through the crack in the timber room? I'm not sure I understand. Perhaps if you clarified it, I could help you. Or anyone else out there, if you know what he's talking about, let me know and I'll publish your hint.

How do you get into Hades? That's complicated, but it can and should be done. Perhaps you should try to exorcise the spirits. Kim Novak could help you there. (For those of you who don't know, she appeared in Bell, Book, and Candle.) The hanging basket? Maybe it could be used to transport items that cannot be carried out of the Coal Mine.

If you look up Aragain Falls in the Encyclopedia Frobozzica (just kidding), you may discover where it got its name. Does anyone really know after what it was named? Drop me a line and I'll publish the correct answer next month.

Well, that's one down. I hope we've answered many of your questions, Roy.

These next two I'm going to throw out for open comment. Send me your name and your hint, and I'll publish it next month. The questions are:

**Enchanter:** "How do I open the Guarded Door without using the kulcad spell? Does the adventurer or the black candle have anything to do with it?" - Tim Holy, Morristown, NJ

**Sorcerer:** "How does one open the trunk in the basement?" - Anonymous

That's it for today, kids. Remember: if you need help or would like to offer

help on any adventure under the sun, write to Lord Demonfire, c/o Scott Brause.

I'll be waiting.

## DOSWRITER

by Don MacLeay - JACG

The Atari is so versatile! Did you know that your Atari has a built-in screen editor program? Most of us who are supposed to know forget because a screen editor is so important to a programmer's sanity that we take it for granted.

Well home computers didn't have them originally and the screen editor in the Atari is so good I'm elevating it to program status and calling it the Atari Screen Editor (the Big "E").

The Big E: is an independent part of the Atari that, as a separate "device", is handled by the Operating System like a disc drive or printer. The advantage of this arrangement is that it's easier to move things around. Like words.

The key to DOSWRITER is the Copy Command (C) on the DOS2 menu. It allows you to move a file of text from the screen (the Big E:) to disk, disk to printer, or disk to screen. Combining the two we have a word processor with the ability to make corrections, store documents, and make multiple copies. Merging can also be done by appending files.

Here's how to do it:

1. Boot DOS2.
2. Type C <RETURN>
3. Type E:,D:NOTES <RETURN>

You are now free to type in what you like. The text that scrolls off the screen will still be written to disk but you won't be able to review it unless you load the file. To end the text type control-3. "Load" the text again with:

4. Type C <RETURN>
5. TYPE D:NOTES,E: <RETURN>
6. Control-1 to pause scrolling.

Embedded control characters such as Esc-Control-Clear and Esc-Control-2 will clear the screen and buzz the keyboard (as well as pause the output temporarily).

The files DOSWRITER creates are compatible with ATARIWRITER and the Program-Text Editor. All the more reason to make these word processors the standard way for Atarians to communicate. I propose two ideas to our members. First, we use this ability to add information, documentation, names, dates, ideas, gossip, and other timely memorabilia to our pass-along disks to inform and entertain each other (no chain letters, please). Second, to standardize the name of the file as D:NOTES.DAT (DAT=data).

More information is in the DOS Reference Manual, pages 30-31.



## FINANCIAL WIZARD 1.5c

by Bill Martin - JACB

Ten years ago, when my wife married me, she promised to love, honor and do the family checkbook. In the time that has gone by since she made that fateful decision, she has dutifully performed her tasks, and with one exception, all has gone well. The problem? Well, when she made her promise she never mentioned that her math skills left something to be desired, so for the next 110 months I had to get out the calculator and find the pennies, dollars and sometimes even the hundreds of dollars that had inadvertently been left in, or out of her calculations. My normal, even temper was, on these occasions, stretched beyond any reasonable limits, and the resulting nagging, crying and hair pulling has left me a broken shell of a man, slightly balding.

All that ceased this past December when the man from UPS, (bless the ground that he walks on), delivered Financial Wizard to my door. One small disk of Software for Atari, one new existence for this hacker. Yes, you guessed it folks! The checkbook balanced on the first try, and with a musical fanfare to boot. (Pun intended). My sleep is now undisturbed by the nightmares that had plagued me for nine years. I rest easy with the confidence that it will happen again this month, and it feels good.

I first became familiar with COMPUTARI'S Financial Wizard through the "Addison Wesley Book of ATARI SOFTWARE 1983", by Stanton, Wells and Rochowansky (copyright 1983 by the Book Company, a division of Arrays Incorporated). Their review, although not totally favorable, whetted my appetite by mentioning that the program would also print my monthly checks. My normally under budget, over spent household produces approximately 60 checks per month, paid out to what seems to be a monumental list of creditors. I had to see for myself.

### GETTING STARTED

Financial Wizard boots with the BASIC cartridge in the left hand slot. Follow the instructions to initialize the disk, but do not confuse the terms "initialization" with "formatting". They are two entirely different concepts, the latter of which would cause the total loss of the program. There are two different procedures for the initialization process. Which one is used, is determined by whether you are using one or two disk drives. Please note that if you choose the single drive option, you are not making a final commitment. You can go back and add in the second drive option at a later date. The single disk drive will allow you to store 100 checks per month, while the double drive option will allow up to 220.

Most of the commands appear on the menu or through direct prompts. It is recommended however, that you read the

documentation before attempting to use "FW". This 40 page booklet has a tear off "Quick Reference Card" as part of the back cover, which should help to "remind" you of the various functions available once you have mastered the instructions.

Financial Wizard is a Personal Finance Package so the obvious place to start is by setting up a budget. If you are at all like my wife and I, a budget is something that you keep trying to earn money enough to pay off. Suffice it to say that this program gives you the opportunity to work out a budget. I do feel that after continued use of "FW" I may be seriously motivated to actually sit down and work one out.

After you complete the initialization, I would recommend that you list all of your credit cards on a chart, (sounds like a budget to me), together with the card numbers. The credit cards are lumped together under category "R" so in order to maintain some semblance of reason you should assign a sub-category letter or number to each of them. You are permitted 26 alpha's ("A" through "Z") and 10 numeric's ("0" through "9"); a total of 36 separate sub-categories. This chart will assist you when writing checks by allowing you to add the account number on individual checks without having to refer to the bill every time you write a check.

### CHECK WRITING

Now that we are on the subject of checks, I'll confess. I really did purchase this program because it writes checks. The first time I used it, it actually saved hours of time. The entries are simple and straight forward using menu and pre-formatted inputs. The checks themselves are specially printed by the same company that prints my regular checks, Deluxe Check Printers. A call to them at Area Code 800-628-9242, produced 1000 checks complete with receipt stubs in about two weeks. Be sure you have a current check in front of you when you call, because they need a lot of information from it. The cost of the checks actually set my budget back about \$70.00 including delivery, but I still think that it's worth it. One minor annoyance was caused by a combination of the heavy paper weight and the perforations of the checks which sometimes allows the roller shaft of my Prowriter to kick out.

### CHECK JUSTIFICATION

When your monthly statement arrives, it is simply a matter of calling up "Check Balancer" from the menu and following the prompts. Each check you have written appears on a list with the number, amount, payee and category. Referring to your bank statement you clear each check by entering an asterisk next to the check in the display. Since your statement and display are in numerical order it is easy to verify the amount at the same time.

### ALL THIS AND PRINTER TOO?

"Check Search" is a powerful concept that allow's you to search for a particular



check or checks. The parameters are virtually unlimited. You can search for a particular check number, date, month or months, payee or amount. My account has cash reserve checking and I wanted to see if I had used it during the past few months. Cash is transferred in blocks of \$100.00 so all I did was ask for all \$100.00 transactions. "FW" not only told me, but added the totals up.

I have even found limited use for some of the other programs supplied. The "Tabulations" section will compare your expenses on a monthly, year-to-date or by category versus your budget. The "Bargraph" program will do the same thing in bargraph form. Incidentally, the "FW" supports the Atari 825, Centronics (739), Prowriter (8510AP), NEC (8023), and the Epson (with graftrax chip) for both check writing and bargraphs.

#### THE FINAL TEST

After I had entered my December checks, I had all that I could do to control myself, waiting for my monthly statement to arrive. Fortunately for my wife, it was delivered in the Saturday mail and she was able to witness the miracle. The checkbook balanced no later than 15 minutes after I arrived home from the Post Office. My confidence was so great that I called her in from feeding the baby. "Watch", I said as I depressed the Return Key. "Crunch, crunch, crunch"; the monitor reflected as it processed the data. Then, with a musical fanfare, the statement "By Jove, I think Financial Wizard did it.", appeared, and I believed it!

#### Forming A Costa Rican Computer Club

by Roy Lent - JACG

Sound like an unlikely place for a computer club? Not really; personal computing is booming here! Three years ago a group of five Americans decided to form a computer club, which was really a Sinclair users group, because that is all anyone had. Now we have 110 members and are in the process of becoming a legal association with a mouth-full name: La Asociacion Costarricense de Computacion y Telematica.

Around half our members have Commodores, but we must be patient with them. They will come around. I skipped those intermediate steps and graduated directly from Sinclair to Atari!

Although our group started off made up of just Americans we now have far more Costa Ricans than foreigners. Our meetings are carried out in Spanish but when members are talking among themselves one hears lots of English. It is difficult to talk about computers in Spanish because many of the terms just don't exist yet in that language. You end up with a string of English terms hooked together with Spanish grammar. And when a term has been

officially added to the language it is sometimes downright silly. For instance, the word "computadora" is in common use but the official term is "ordenador de datos" or, literally, "data organizer." That just doesn't organize, excuse me, compute!

What is our biggest problem here? Custom duties! Although the Costa Rican government is quite democratic, fairly well set up as governments go (with a touch of comic opera), and generally easy to get along with it has somehow decided that computers are an unnecessary luxury and put duties totaling 130% on anything related to computation. As a result, if a person here says that he has a personal computer, he is in effect admitting that he is a smuggler! When someone is going to get a new item of hardware or software from the U.S. his primary consideration is the route to use to get it down here without going through customs. Complex arrangements must be made that can often take months. The commonest way is to find someone who is coming to Costa Rica and who is willing to slip the article in hidden in his suitcase. Customs here does not check tourist luggage very thoroughly (usually!). More dramatic methods of bringing in shipments are rarer but do occur. It is unfortunate that these "cloak and dagger" type activities are necessary but what would you do if you had just paid \$300 for a new computer and the government insisted that you had to pay \$400 more to be allowed to take it home?

Among the projects that our association is working on is a national personal computer exposition to take place in February of next year. We hope that this exposition will earn enough money to buy the equipment needed to set up Costa Rica's first bulletin board.

In most of the other surrounding countries (an exception is Panama) personal computing is almost unknown. I recently had a visitor from Honduras who spent hours watching demos of what my Atari could do. The whole concept of having your own computer in your house was startlingly new to him. In spite of the ridiculous customs duties, it is estimated that there are 2000 personal computers in use in Costa Rica. For a mainly rural country of 2,200,000 population that's not a bad start.



**DON'T FORGET!**  
Contribute an article this month.



## THE TOWER OF HANOI

by Kenneth Pietrucha - JACG

Rubik's Cube was not the first puzzle to completely confuse civilized man. In the nineteenth century, a French mathematician by the name of Edouard Lucas, invented a puzzle which he called the Tower of Hanoi. The toy, or puzzle if you wish, consisted of three pegs or sticks. One peg had a number of disks on it, each of a different diameter. The largest disk on the bottom and the smallest on the top. The problem was to transfer the tower of disks to either of two vacant pegs in the fewest possible moves. You must move the disks one at a time and never place a larger disk on top of a smaller one.

The computerized version of this puzzle can be found on disk #5 from the J.A.C.G. disk library under the program name "Towers". If you look at the library list closely, you will also notice that this program has a math classification, although from all appearances it seems nothing more than a puzzle.

The math classification is closely linked to the minimum number of moves required to make the transfer. The minimum number of moves is related to  $N$ , the number of disks, by the formula  $2^N - 1$ . A three disk transfer should therefore be possible in 7 moves, while a six disk transfer would take 63 moves.

The legend associated with this puzzle is almost as interesting as the puzzle itself. In his 1892 encyclopedia of puzzles, Mathematical Recreations and Essays, W.W.Rouse Ball describes this legend. "In the great temple at Benares, beneath the dome which marks the center of the world, rests a brass plate in which are fixed three diamond needles, each a cubit high and as thick as the body of a bee. On one of these needles, at the creation, God placed sixty-four disks of pure gold, the largest disk resting on the brass plate, and the others getting smaller and smaller up to the top one. This is the Tower of Bramah. Day and night unceasingly the priests transfer the disks from one diamond needle to another according to the fixed and immutable laws of Bramah, which require that the priest on duty not move more than one disk at a time and that he must place this disk on a needle so that there is no smaller disk below it. When the sixty-four disks shall have been thus transferred from the needle on which at the creation God placed them to one of the other needles, tower, temple and Brahmins alike will crumble into dust, and with a thunderclap the world will vanish."

Before you sell your stocks, I think you should try and figure out how many moves the priests will have to make to complete the transfer.

Taking 2 to the sixty-fourth power and subtracting one gives the twenty digit number 18,446,744,073,709,551,615. Even if the priests knew the proper sequence it would still take thousands of millions of years moving a disk at a rate of one per second.

You can solve the puzzle for any number of disks by transferring the smallest disk on every other move, always moving this disk in the same direction. If you move clockwise, when you reach the third peg, you start back at the first peg again. On the alternate moves, you will have only two choices. You must make the only transfer possible that does not involve the smaller disk. It is also interesting to note that if you number the disks serially, the even numbered disks circle in one direction and the odd disks circle in the opposite direction.

One word of caution, the computer program only accepts the complete transfer when all the disks wind up on the right hand peg. The references say that the puzzle is over when the transfer is made to any peg, so if you want to play the game correctly, you should modify the program to accept the fact that the game is also over when all disks end up on the center peg. (If you start rotating the smallest disk counter clockwise, first move to peg #3, and don't make any mistakes, you will finish the game with all the disks on the right peg.)

Before I close this article, let me show you an interesting program that was used to calculate the twenty digit numeral representing 2 to the sixty-fourth power. The program is a slightly modified version of the Super Accuracy Program in the Commodore 64 Idea Book by David Ahl of Creative Computing.

```
20 DIM A(100)
30 M=0: C=0
40 D=0
50 FOR I=1 TO 50: A(I)=0:NEXT I
60 A(I)=1
70 I=0: C=0
80 M=M+1
90 I=I+1
100 B=A(I) + A(I) + C
110 IF B<10 THEN C=0:GOTO 140
120 B=B-10
130 C=1
140 A(I)=B
150 IF I<D THEN 90
160 IF C=1 THEN 90
170 PRINT M,
180 D=I
190 FOR N=I TO 1 STEP -1
200 PRINT A(N);
210 NEXT N
220 PRINT
230 GOTO 70
```

Because of the way the computer is calculating one digit at a time, normal LPRINT statements do not seem to work. To use your printer add the following line:

```
10 POKE 838,166:POKE 839,238
```

This will send the screen to the printer. To return your system to normal do a POKE 838,163:POKE 839,246. I won't explain in detail how the program works, but the heart of the program is in line 100 with the powers being calculated by successive addition. I hope I have succeeded in whetting your appetite for large number calculations.





PENNYFARTHING

Logo Art by  
Frank Pazel/JACG

Who Or What  
Is Syzygy??

Turn to page 25 for the answer.



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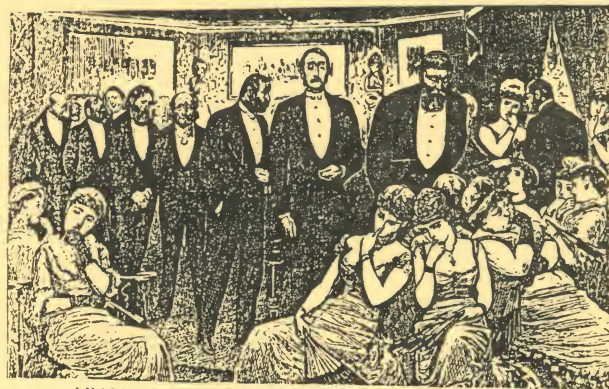
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WHAT! NO COMPUTER GAMES?  
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Sometimes You Go Too Far

No, these are not the refugees from a marathon beer bust. They are our faithful representatives Scott Brause, Art Leyenberger, and Dick Kushner at the recently held Ataricon. If you had been up as many hours at this point you probably would need six people to hold up the banner. Right on, guys! Nice smiles.



# ART OF COMPUTER GAME DESIGN

by Chris Crawford

Reviewed by Donald Forbes - JACG

In DE RE ATARI Chris brought us the insides of the machine. In this book written from May to December 1982 he brings us the insides of computer games. As he told us at the meeting over Memorial weekend, he wrote the book to clarify his own thinking. If you missed that meeting, you will remember him from TANKTICS, ENERGY CZAR, SCRAM, EASTERN FRONT, LEGIONNAIRE, and EXCALIBUR.

Chris has a message. I could stand here and tell you what he said (like those talkative TV commentators love to do after every Presidential address that you just finished watching). Instead, I believe you would rather have him speak for himself. So here goes:

**Preface:** Computer games constitute a new art form. Art evokes emotion though fantasy. Most art forms allow very little audience participation. Artists can say so much in their work and most people will hear so little because, locked in the role of passive audience, they cannot actively participate. The computer, given sound and graphics, emerged as a medium for emotional communication. The computer game has emerged as the prime vehicle for this communication. A game is intrinsically participatory. Participation increases audience attention and heightens the intensity of the experience.

Real art through computer games will never be achieved as long as we have no principles of aesthetics, no framework for criticism, and no model for development. We game designers must put our shoulders together so that our successors may stand on top of them. This book is my contribution.

**What Games Are and Why People Play Them:** I perceive four major categories: board games, card games, athletic games, and computer games. A game is a closed, formal (has explicit rules) system (a collection of parts that interact) that subjectively represent (but do not physically represent) a subset of reality (the subset provides focus to the game). Games provide interactive experience, a crucial factor. Contrast games with puzzles and other noninteractive challenges; a game that emphasizes puzzles will rapidly lose its challenge once the puzzles have been solved. A story presents facts in an immutable sequence, while a game offers a branching tree of possible sequences and allows a player to create his own narrative. The storyteller has direct creative control over his audience's experience; the game designer has indirect control; the toymaker has almost none.

Interaction transforms the challenge of the game from a technical one to an interpersonal one. Conflict arises naturally from the interaction in a game. Conflict in games usually tends to be exaggerated to its

most intense form--violence. In short, a game is a safe way to experience reality. People play games for fantasy fulfillment, nose-thumbing, proving oneself, social lubrication, exercise, and need for acknowledgment. We can at this time identify only two broad, vague, overlapping groups of players: skill-and-action enthusiasts and players of cognitive games.

**Taxonomy of Computer Games:** I see two broad categories: skill-and-action or S&A (emphasizing perceptual and motor skills) and strategy or cognitive games (emphasizing cognitive effort). I group S&A games in six categories: combat, maze, sports, paddle, race and miscellaneous. I divide strategy games into six categories: adventures, dungeon and dragons, war games, games of chance, educational, and interpersonal (relationships between individuals -- undeveloped but promising). The taxonomy suggests new areas to explore.

**Computer as a Game Technology:** The most striking feature is responsiveness. A second valuable feature is ability to function as a game referee. Another advantage is real-time play. An additional strength is their ability to provide an intelligent opponent. Another advantage is its ability to limit the information given to players, which encourages use of imagination. Computers have weaknesses. The most painful one is limited input-output capabilities. Good graphics are hard to come by. Input is made even more difficult by the indirectness of keyboards and joysticks. The final weakness is the requirement that it be programmed--a tedious and difficult process that is not easily delegated.

These characteristics imply several precepts: Go with the grain. Don't transplant. Design around the I/O. Keep it clean. Store less and process more. Branch softly (at execution time, not design time). Maintain unity of design effort. Computers do some things poorly; the artist's role is to sidestep their weaknesses.

**Game Design Sequence:** Choose a goal and a topic (this vitally important step seems obvious, yet is ignored time and time again by game designers who set out with no clear intent). Research and preparation (your game must have the authentic feel of the real world). Design phase (create the outlines of the I/O structure, the game structure, and the program structure). Playtesting phase (Ideally, playtesters would also be game designers who would share your appreciation for the trade-offs essential to good game design. Never use more than five or six.) Post-mortem (Brace yourself for the critics: they will get their filthy hands on your lovely game and do the most terrible things. The public is another matter; if they don't buy your game, you lose...Are you willing to be a starving artist?).

**Design Techniques and Ideals:** How do we design the game to challenge the human being? Four techniques are available: Vast resources (the human player's advantage in intelligence is offset by the computer's material advantage). Artificial intelligence



(a point system for quantifying the value of each possible move; in several of my war games I have used safety and danger fields which tell a unit how much safety or danger it faces; if you can't come up with a good way to use a feature, you really have no choice but to delete it; create an array of virtual positions to coordinate the moves of many units and prevent traffic jams; create a number of algorithms and switch from one to another as conditions change). Limited information (to compensate for the computer's lack of intelligence, limit the amount of information available to the human player). Pace (a player may be smart, but the computer is much faster).

Relationships between opponents: Symmetric relations (the greatest weakness is their relative simplicity). Asymmetric games (players are allowed to select initial traits according to a set of restrictions; the human player is given resources that allow him to bring his superior planning power to bear, and the computer gets resources to compensate for its inferior intelligence). Triangularity (best illustrated by the game rock breaks scissors, scissors cuts paper, and paper enfolds rock). Actors (players do not battle each other directly; they control actors who engage in direct conflict). Smooth learning curves (challenge players at all levels). Illusion of winnability (the game must never be truly won or it will lose its appeal).

Development of EXCALIBUR: When I tell other designers I am working on a game about leadership, I am met with quizzical expressions. Is it a space game, a war game, or a dungeon game, they wonder. They seem satisfied when I tell them it is a game about King Arthur. I wanted this game to be grand and glorious, so lofty in its goals and challenging in its play that it would put all others to shame. What is leadership? The answer would be central to the game. The player in this game would be King Arthur, and his goal would be to unify Britain after the collapse of Roman authority and bring peace to the troubled land. There were to be nested games. CAMELOT would include management of his own Kingdom. BRITAIN would allow Arthur to travel around with his army. BATTLE would allow Arthur to engage enemy armies in direct conflict. A major turning point came when I saw the movie EXCALIBUR which beautifully captures the best elements of the Arthurian legends. I rededicated myself to the high artistic goals I had set earlier.

The Future of Computer Games: Consider two extreme hypothetical futures: no technological and no artistic development. I am stuck with an Atari 800 as my sole medium for game design. This does not worry me too much; I could explore the possibilities of this machine for five or ten years before beginning to feel trapped. The second world, though, is a bleak place indeed...We can expect three factors to affect games: the mass market, the flowering of heterogeneity, and the evolution of taste. The artistic challenge is vast, yet we have managed to charge stone, pigment, taut string, and celluloid with feeling. We will succeed with silicon.

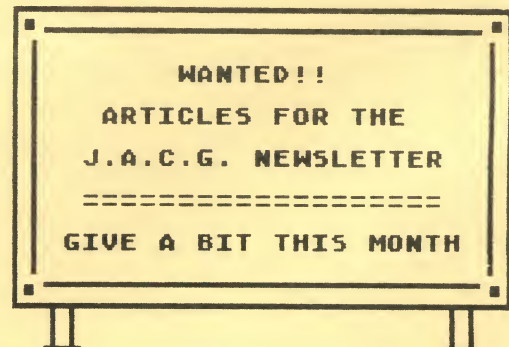
Now that you know what Chris Crawford DID say, let me tell you what he DID NOT say. On page 82 he opens a door briefly, and then bangs it shut:

"Many games are non-spatial and other artificial intelligence techniques are required. One of the most common types of non-spatial games uses coupled differential equations to model complex systems. LUNAR LANDER, HAMMURABI, ENERGY CZAR, and SCRAM are all examples. The primary problem facing the designer of such games is not so much to defeat the human player as to model complex behavior. I advise the designer to be particularly careful with games involving large systems of coupled differential equations. HAMMURABI uses three coupled first-order differential equations, and most programmers find it manageable.

"But the complexity of the problem increases enormously with the number of differential equations used. ENERGY CZAR used 48 differential equations, a feat made believable only by the fact that many constraints were imposed on them. In general, be wary of more than four coupled differential equations. If you must use many differential equations, try to use parallel ones in which the same fundamental equation is applied to each element in an array of values.

"To help keep the system balanced, each differential equation should have a damping factor that must be empirically adjusted: [new value = old value + (driving factor / damping factor)]. A small damping factor produces lively systems that bounce around wildly, a large one sluggish systems that change slowly. Unfortunately, recourse to simple damping factors can backfire when a negative feedback relationship exists between the new value and the driving force. In this case, large damping inhibits the negative feedback and one of the variables goes wild. The behavior of systems of differential equations is complex. I suggest that designers interested in these problems study the mathematics of overdamped, underdamped, and critically damped oscillatory systems. For more general information on solving systems of differential equations, a good textbook on numerical analysis will serve as a useful guide." PERIOD STOP

Perhaps we will be lucky and Chris will write his book on "Mathematics and Artificial Intelligence in Computer Game Design." There lies the real story.





## TELECOM

By Lawrence Moriano - JACG

In order to get a better understanding of Telecommunications, a greater knowledge of the terminology most commonly used must be established. In my column this month I am going to explain the terms most commonly used in telecommunications and how they should help you to determine the type of modem to buy.

The term Baud Rate is the speed which a modem sends its data to the screen. The two most common baud rates are 300 and 1200. The home user should only be concerned with the 300 baud rate because the majority of the free bulletin boards around the country only operate at this rate. There is a higher charge for the 1200 baud if you decide to get online with CompuServe or the Source.

AUTOANSWER will allow you to load a file into a buffer. When your phone rings it will automatically send your file to another computer. This is a useful method of sending and receiving files, even when you are not at home. This feature is also important for the person who wants to start his/her own bulletin board.

AUTO/DIAL will store your most commonly used phone numbers on disk, and your computer will automatically dial them for you. This is a convenience feature which saves you time, but it is not a necessity.

FULL/HALF DUPLEX is the direction which the data flows between two computers. At half duplex the data is going in one direction at a time. In full duplex the computer receives and sends data at the same time. The purchase of a modem which only supports half duplex is not recommended because to communicate with most commercial data bases. Full duplex is required.

Most commercial data bases and bulletin boards offer many public domain programs which you can copy over your phone line. This process is called DOWN/LOADING. To send a program from your computer to another computer is called UP/LOADING. Simple as it may seem, there are still modems being manufactured today which will not support this feature. Buyer beware; don't forget to read the fine print.

One other feature to consider is the ability for your modem to be compatible with commercial terminal software. In my opinion, modems which only support their own terminal software are at a disadvantage because you are locked into one system and its features.

Well, this brings me to the end of another column. As the THANKSGIVING HOLIDAY starts to approach us, it is time to reflect and be thankful for all the fun, new friends, and information we all have received by being a member of J.A.C.G. We need your support, so GIVE A BIT.

UNTIL NEXT MONTH  
HAPPY THANKSGIVING

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ALL SO! IT'S A GOOD THING FOR US  
FEW AMERICANS KNOW A GOOD THING  
WHEN THEY SEE IT.

WANTED!!

ARTICLES FOR THE  
J.A.C.G. NEWSLETTER

=====

GIVE A BIT THIS MONTH



## The Toolshed

by Pat Warnshuis - Portland Atari Club

Wynn Smith, of Mosaic Electronics, sent me a card with a really fun idea. Don't get started with this thing until you've said goodnight to your loved ones. In fact, better not get involved on a work night. OK, everybody to the keyboard!

Start off nice and easy: in the direct mode, type POKE 53261,128:POKE 53248,60. See that nice, fine line down the left side of the screen? That's player 0 from the player-missile family (one of the original Coneheads). So what? Well, that line would look the same in any graphics mode. For Graphics 0, you could use it to set off a column of numbers. 53261 sets the shape for the Player 0 line. Just POKE 53262 with a number for a line using Player 1, POKE 53263 for Player 2, etc. 53248 controls where the line will appear on the screen. On my TV line 50 is the left margin and line 208 is the right margin. Try to find yours.

Now, change the line by POKE 53261,129. This gives you two lines. You could move them to bracket a 2-number column of figures. Remember, you can add more lines using the other Players in locations 53261 to 53265. You can move the lines around using locations 53248 to 53254.

Now, the big stuff! POKE 53261,255. A nice broad stripe, right? POKE 53256,3 to make the line 8-columns wide, or POKE 53256,1 for a 4-column stripe. POKE 704 to 707 to change the colors of the stripes for Player 0 through Player 3. Think how you could use this for highlighting columns in a display screen. Or POKE 53256,2 to get back to normal width and see how you could add colored borders on the sides of your screen.

Hey; try this:

100 POKE 623,32+16;1

101 REM Combines the four 2-column missiles into one player, color 711

110 POKE 53261,255:POKE 53248,52:POKE 704,16\*3+2:POKE 53256,3

120 POKE 53262,255:POKE 53249,84:POKE 705,16\*5+4:POKE 53257,3

130 POKE 53263,255:POKE 53250,116:POKE 706,16\*14+6:POKE 53258,3

140 POKE 53264,255:POKE 53251,116:POKE 707,16\*2+8:POKE 53259,3

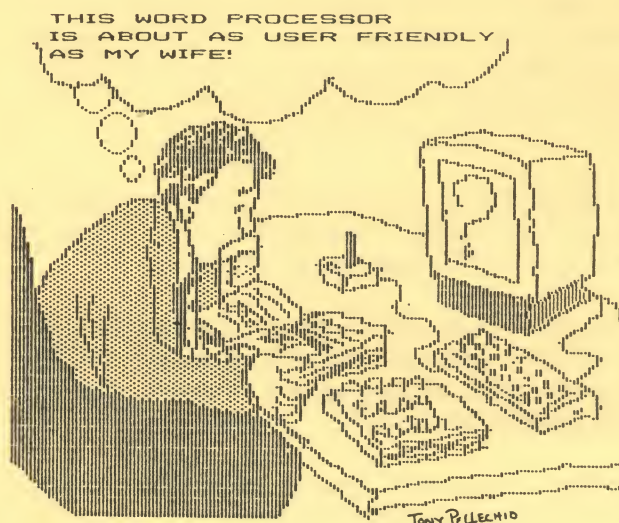
145 POKE 53265,255:POKE 53253,170:POKE 711,16\*2+4:POKE 53260,3

Now, in the direct mode again, try:

FOR H=50 TO 206:POKE 53248,H:FOR I=1 TO 10:NEXT I:NEXT H

Notice the effect of the overlayed colors as one stripe passes over the others. Dink around with it. Change width, color, shape, and position.

Remember, it works in an graphics mode so you get free vertical lines or area highlighting in additional colors. Meanwhile, it should desensitize you to using PM graphics. Check your Memory Map later to see what you're controlling. I like it!



## Syzygy

Syzygy is the name Nolan Bushnell founded Atari under in the early 1970s. It was the first company he formed and it produced the now famous Pong game, the grandfather of arcade games.



WHAT GOOD IS THIS TELEPHONE  
IF I CAN'T CONTACT A BBS!

Thank You, West LA

From the West LA Atari UG newsletter:

"Another of the country's best, the JACG (Jersey Atari Computer Group) newsletter is very large and always packed with very high quality articles."

**BUT ONLY IF YOU  
GIVE A BIT!!!**

Send in your contribution this month.



## TRADING POST

Trading Post is a service for JACG members who wish to sell or swap items of any type. There is no charge for this service. Material must reach the Editor by the 20th of the month to be considered for inclusion in the following month's Trading Post. No commercial services or items will be accepted.

>>>>>>>><<<<<<<<

**FOR SALE:** Mosaic 64K RAM w/cable, new, in box. Was \$169 mail order, will sell for \$135. Contact Chris Bond at 745-4002 or 756-4964.

**FOR SALE:** Atari 1020 Color Printer, just tested. Was \$79.95; will sell for \$65. Complete in box with extra pens, basic graphics cassette. Contact Chris Bond at 745-4002 or 756-4964.

**WANTED:** Atari 810 disk drive in good shape. Call Frank Pazel at (201) 627-8845.

## FLEA MARKET RULES

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In order to clarify the intention of the Executive Committee in sanctioning the use of the BTL lobby before and after monthly meetings for use as a member flea market we publish the following rules:

1. All flea market sellers must be current JACG members.
2. Space is provided on a first-come, first-served basis.
3. Only ORIGINAL programs with ORIGINAL documentation may be sold in the area of software.
4. Hardware of any type may be sold normally without constraint. The Executive Committee reserves the right, however, to limit the physical size and space consumed by such hardware.
5. Flea market business will be conducted only in the lobby and ONLY when the meeting is not in session in the auditorium.
6. The Executive Committee reserves the right to deny or suspend the privilege of flea market usage to any person, member or not, for infraction of these operating rules.

GIVE A BIT!!!

Contribute to the Newsletter this month.

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HELP\$\$\$!!

Your JACG needs YOUR help. We need two volunteers to distribute the newsletter before each meeting. It will only take a half hour of your time and will speed up distribution. See Larry Moriano or any officer, even if you can only help out occasionally.

JUST AS IMPORTANT: Mailing costs have risen because people aren't picking up their newsletter. We see many people at meetings who fail to get their newsletter, for who knows why. At anywhere from 37 to 54 cents per mailing this really puts a burden on the treasury. Please make every effort to pick up or have someone pick up for you.

## JACG MEMBERSHIP

The Jersey Atari Computer Group (JACG) invites you to become a member. Dues are \$20.00 per year and entitle the member to: 1) Receive the monthly newsletter; 2) Purchase programs from the group's extensive tape and disk libraries at special rates; 3) Join special interest groups or form new ones; 4) Benefit from the expertise and experience of other Atari computer users; 5) Participate in group purchases of software at substantially reduced prices; 6) Receive a membership card that entitles the member to discounts at local computer stores; 7) Attend monthly meetings to learn about the latest hardware and software, rumors, and techniques for getting the most out of your Atari computer; 8) Submit articles and programs to the newsletter and give demos and presentations at the monthly meetings; 9) Participate in sale/swap activities with other members; 10) Access the JACG nationally famous Bulletin Board; and 11) Have a lot of fun.

If all of this sounds good to you send a check or money order, payable to JACG, to:

Ron Kondos  
201 Lake Valley Road  
Morristown, NJ 07960

Remember, receiving the JACG newsletter is just one of the many benefits of being a member of JACG.



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Discount rates available upon request.

Contact: Joseph Rowland  
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ZOTS! I forgot to renew  
 my JACG membership.



"It was bound to happen—they're beginning to think like binary computers."

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for your ATARI. Asterisks indicate advertisements elsewhere in this newsletter.

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**CHECK YOUR MAILING LABEL  
 FOR MEMBERSHIP EXPIRATION DATE**

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Arthur Leyenberger

Last Issue: 09/85

FIRST CLASS MAIL

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JACG NEWSLETTER - VOLUME 4, NUMBER 3  
November 1984

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